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ABSTRACT

This study examined the reactions of teachers implementing a specific process of teaching for higher-level thinking, investigating how they viewed: their role in the classroom, student involvement in learning, and school-based, systemic conditions to address when teaching for higher-level thinking. Data were gathered from teachers in a master's level course on teaching thinking skills. The course taught teachers to design lessons based on the Thinking/Learning (T/L) System, which encourages higher-level thinking without interfering with the regular curriculum. Teachers designed two lessons according to the T/L System's activities selection sheet and taught them in their classrooms. They completed the Thinking/Learning System Lesson Evaluation form and end-of-course interviews that asked what they learned from teaching T/L lessons. Teachers learned that teaching for higher-level thinking required significant planning; students' (and teachers') higher level thinking and activities related to higher level thinking took more time and resources than were available; and to adequately assess performance related to outcomes of higher-level thinking, there must be acceptable, appropriate alternative assessments. The higher-level thinking activities led to more students being actively engaged in the learning process. (Contains 17 references.) (SM)

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# TEACHING FOR HIGHER-LEVEL THINKING: AN ANALYSIS OF TEACHER REACTIONS

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## Introduction

We live in a complex, changing society (Lewis, 1998; Singham, 1998; Beane, 1998; Eastin, 1999; Tucker & Codding, 1999). School-based educators, particularly classroom teachers, are faced daily with young people who have a variety of abilities, interests, and levels of achievement, much more so it seems today than in years past (D'Arcangelo, 1998; Beane, 1995; Caine & Caine, 1994, 1997). Teachers need to be increasingly knowledgeable of methodologies that assist them with the challenging prospects of individualizing instruction (Armstrong, 1994; Checkley, 1997). Also, teachers need to understand how various learning processes integrate to form workable instructional strategies that "lead to the formation of usable knowledge structures" (Derry, 1988/1989, p.5). Paul (1989, p.62) claims teachers need to "...redesign lessons so that they'll encourage more critical thinking on the part of the students." Similarly, Resnick (see Brandt, 1988/1989, p.15) says, "We have to figure out how to teach in ways that don't just 'impart' knowledge, but instead helps students to construct their own interpretation."

I comment in a previous article (see Sparapani, 1998) that for several years now, the issue of teaching for higher-order thinking has confronted those of us in education, particularly school-based educators. Central to the issue has been how teachers are to move student learning from the "drill and kill" of basic skills worksheets to interacting with the abstract concepts of a discipline, i.e., to begin constructing their own interpretations (as Resnick suggests). Discussions with teachers show that they are aware of the need to move "beyond" the basics, but are not always certain how to move beyond the basics,

on the one hand, nor are they sure, on the other hand, if such a move would be acceptable or appropriate based on the emphasis in today's arena on higher standardized test results.

Teachers naturally are concerned about student learning. They especially are concerned about student learning that is measured by legislatively-mandated (standardized) assessments that affect the public's image of what they do, and the reputation of their schools and school districts. As a result they tend to avoid instructional practices that are not familiar or may be perceived as not achieving the desired outcomes, i.e., higher scores on standardized tests. In an age, however, when it is imperative that people be good thinkers, administrators, the media, legislators, parents, need to encourage teachers to feel comfortable experimenting with practices that challenge students to think at higher levels.

## Research Purpose

An instructional strategy that is not familiar or may be perceived as not achieving the desired learning outcome is the issue examined by the research presented here, which explores the reactions of teachers when implementing a specific process of teaching for higher-level thinking. The research considers (1) how teachers view their role in the classroom, (2) student involvement in their learning, and (3) school-based, systemic conditions that may need to be addressed when teaching for higher-level thinking.

## Methods

The research followed the situational analysis case study design described by Borg and Gall (1983). "In this form of case study, a particular event is examined from the viewpoint of all the major participants" (Borg & Gall, 1983, p.489), in this case teachers. Pupils in classroom were also participants, but data were not gathered directly from them.

Data were gathered over two semesters from teachers (N=39) in a master's level course in teaching thinking skills. Teachers were from all levels of education (elementary through college) and represented virtually every subject matter area. The teachers in the course, in addition to learning about the theory of thinking, learned to design lessons based on the Thinking/Learning (T/L) System. The T/L System (see Edwards & Sparapani, 1996; also, Attachments A, B, & C) was a process for encouraging higher-level thinking designed by me and a colleague (Edwards) that teachers could implement in their classrooms without interfering with the regular curriculum. Course participants (i.e., the teachers) designed two lessons according to the T/L System's "Activities Selection Sheet" (see Attachment D) and taught the lessons in their classrooms or other appropriate setting. After teaching the lessons, qualitative data were gathered from each teacher using the "Thinking/Learning System Lesson Evaluation" form (see Attachment E) and through end-of-course interviews with each teacher. During the interview, teachers were asked to "tell me at least five things about what you learned from teaching the T/L lessons."

## Results and Discussion

The purposes of this research were to consider three main issues. These were (see introduction) to examine (1) how the teachers viewed their role in the classroom, (2) student involvement in their learning, and (3) school-based, systemic conditions that needed to be addressed when teaching for higher-level thinking. Analysis of the responses to the "Thinking/Learning System Lesson Evaluation" and the end-of-course interviews clustered around five overlapping and not necessarily mutually exclusive categories. I labeled each category (1) lesson planning and assessment, (2) curriculum coherence, (3) changes in classroom practice, (4) student involvement/engagement in their learning, and (5) systemic conditions.

### 1. Lesson Planning and Assessment

Teachers commented that they had to spend more time planning the lessons because they had to think of appropriate T/L activities that might encourage their students to think in a particular way, i.e., information processing, critical thinking, creative thinking, decision making. Also, teachers commented they found themselves "thinking" at different levels. They had to think beyond "the basics" because they wanted their students to do likewise. The teachers found themselves accepting the idea of "less is more." They wanted the students to access their prior knowledge. As a result, the teachers needed to decide what new knowledge was most appropriate to teach and what activities would assist in accessing the prior knowledge and serve as a springboard to higher-level learning. The teachers realized that if they were asking their students to

explore new information at a higher level, they (the teachers) had to make more appropriate choices about what to present through direct instruction. Also, it became apparent to the teachers that in order for the activities in the lessons to be meaningful to the students, they had to have a "real world" application. Additionally, the teachers realized as they were designing the activities, teaching the lessons, and observing the students that their traditional assessment procedures would not be adequate to determine level of performance. Most teachers indicated that different assessment procedures needed to be developed, but were not sure what form those should take.

## 2. Curriculum Coherence

As a result of the T/L Lessons, and consistent with how Beane (1995), Caine and Caine (1994, 1997), and Armstrong (1994) discussed classroom practice, teachers saw that their pupils began making connections (on their own) with not only their prior knowledge, but more specifically with other disciplines. Students began "seeing" with regularity how information in one subject matter area was related to one or more other subject matter areas. More importantly it became apparent to students that knowledge was not learned in isolation, but that there were sometimes subtle and sometimes obvious within discipline and across discipline connections that could be identified. The insight that what teachers wanted to learn was not learned in discrete "chunks," but actually related quite directly to other learning (that the curriculum actually had some coherence to it) was met with surprise by the students and pleasant satisfaction (and also surprise that the students were able to figure it out without prodding) by the teachers.

## 3. Changes in Classroom Practice

The changes that occurred in the climate of the classroom were seen as quite positive by most of the teachers and students and seen as negative by some of the teachers and students. Because of all the activity (active learning) and many students doing a variety of things the classrooms became "noisy," active places. Most teachers and students seemed to appreciate the "activeness." Students particularly enjoyed the flexibility of having choices and not always having to do what everyone else was doing. Most teachers, much to their surprise, became more tolerant of the movement and noise level. Some students and teachers, though, did not agree with all the commotion. These wanted more of the traditional order and structure even if, at the same time, they appreciated the changes in the way the classroom functioned. All teachers, however, began viewing themselves as mentors and guiders of the learning process rather than merely wells of knowledge and dispensers of information. Again, some teachers viewed this as the way they thought teaching should be, and wanted it to be; others wanted to be the dispensers of knowledge and did not seem to enjoy allowing students to make choices about their learning. Classroom changes reported by almost every teacher included (a) the dramatic increase in the level of cooperation they observed among and between students, (b) students appeared to see the classroom as their classroom and seemed to enjoy being there, (c) they (the teachers) found themselves talking less and listening more to the students, (d) students talked to each other more and challenged each other to think more deeply, not accepting superficial responses, (e) the quality of student answers and work improved, (f) they (the teachers) became more time

conscious, i.e., aware that "thinking" took time, (g) students seemed to improve in their ability to handle ambiguity, (h) student motivation seemed to improve.

## 4. Student Involvement/Engagement In Their Learning

Teachers mentioned that during the lessons (a) students seemed to be engrossed in their learning, not detached or going through motions to "get it done," (b) the students spent more time and longer periods of time on task, (c) the level of creativity increased, and (d) the activities involved all students. Teachers commented that students who never (or very seldom) participated became active participants in the classroom. The students found the lessons challenging and interesting because they were able to go beyond "just the facts" and explore a wide range of ideas (leading perhaps to the curriculum coherence mentioned above). Students especially appreciated their ability to make "real world" applications of their learning without a great deal of stretching, which led to more creative outcomes to their learning. In an art lesson for fifth-grade students that dealt with designing buildings and rooms within buildings, for example, as a final project the teacher asked the students to design something, leaving the directions purposely vague. In previous years when this teacher taught this lesson, the assignment was for the students to redesign their favorite room at home. This time, she allowed the students the option of designing or redesigning any kind of building or room they chose, and she used her favorite room at home as an example. Several students redesigned the classroom. Several students designed their dream homes, complete with landscaping. One student, much to the chagrin of the teacher because it really did not fit the expectations of the lesson, designed the "perfect" bridge. One student

designed an office building. No student designed (or redesigned) their favorite room at home.

### 5. Systemic Conditions

School-based, systemic conditions reported by the teachers (and the students) were all fairly negative. One such condition was time. The issue of time was raised by every teacher. It took a great deal of time to prepare adequate lessons. It took longer than the typical one or two class periods for students to complete the activities. Even though students were making connections to the broader knowledge they had learned and were seeking information way beyond the scope of the lesson and their presumed ability levels, teachers believed they were not moving through the curriculum at a rapid enough pace. The scarcity of available resources beyond the textbook was also a major frustration to both teachers and students. In order to accomplish their tasks, students began bringing their own resources to the classroom. The noise level and movement in the classrooms (even if not excessive) was often not received well by administrators or teachers in proximal classrooms. Coordination with other school facilities (e.g., computer room and library) was difficult and in many cases impossible. Teachers typically had very limited access to, or no access to, available computers or library resources not already in their classrooms.

## Conclusions

The teachers who participated in this study were all motivated to examine appropriate methods of teaching for higher-level thinking. To that purpose, they were enrolled in a

course about teaching thinking skills. They learned that (1) teaching for higher-level thinking took a great deal of planning, (2) higher-level thinking on the part of students (and themselves as teachers) and activities related to higher-level thinking took more time and other resources than were readily available, and (3) to adequately assess performance related to the outcomes of higher-level thinking, acceptable, appropriate alternative assessments needed to be designed. The results showed, however, that the higher level thinking activities seemed to have the desired effect. More students were actively engaged in the learning process. Students became more creative, independent, and responsible (less dependent on the teacher). Teachers became mentors and guides not "just" dispensers of information.

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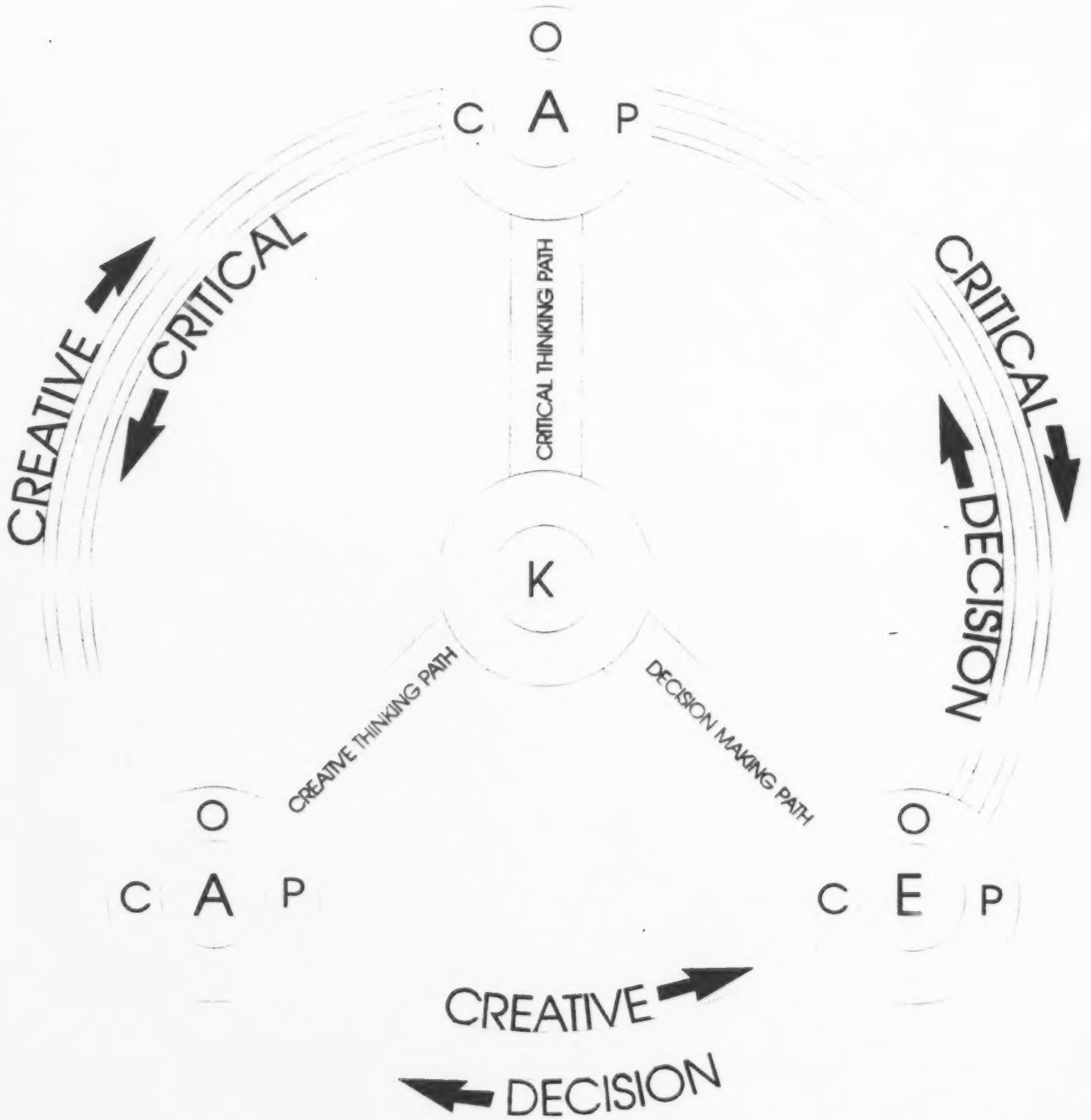
Attachment A

# MODEL OF THE THINKING/LEARNING SYSTEM

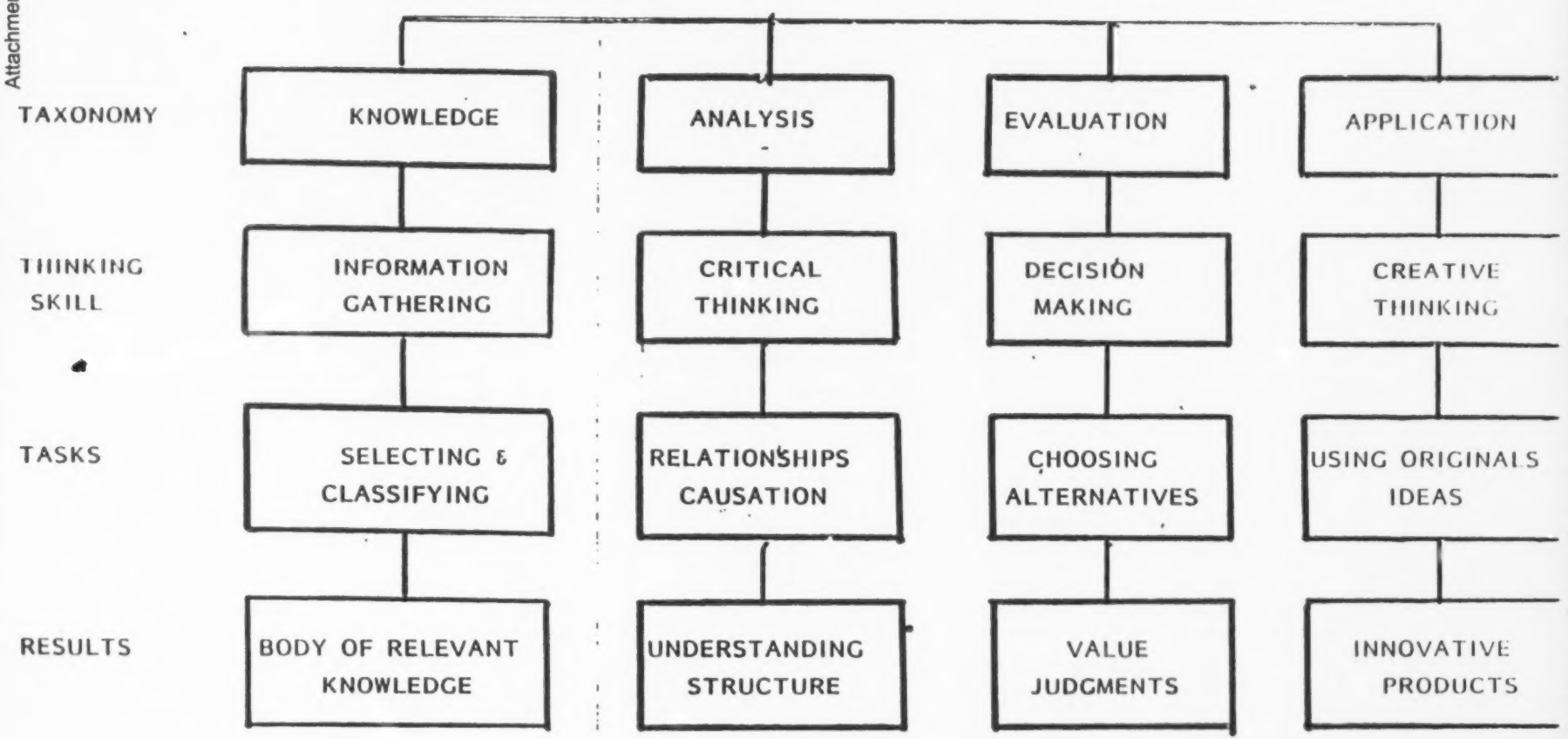





EDWARDS & SPARAPANI, 1993

Attachment B

# THE THINKING/LEARNING MODEL



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9/90

# BLOOM'S TAXONOMY OF COGNITIVE OBJECTIVES

1. KNOWLEDGE
2. COMPREHENSION
3. APPLICATION
4. ANALYSIS
5. SYNTHESIS
6. EVALUATION

THE THINKING/LEARNING SYSTEM
Activities Selection Sheet

SUBJECT: _____

TOPIC: _____ NAME: _____

DATE: _____

MAJOR OBJECTIVE:

Specific Objectives:

1. Knowledge:
   a)
   b)
   c)
2. Analysis:
   a)
   b)
   c)
3. Evaluation:
   a)
   b)
   c)
4. Application:
   a)
   b)
   c)



Edwards/Sparapani, 1993

Name: _____

T/LS Lesson: _____

## Thinking/Learning System Lesson Evaluation

**Directions**: Respond thoroughly to each area. You may want to reproduce this on a word processor.

A. **Strengths of the lesson** (list at least three)
1.
2.
3.
4.
5.

B. **Weaknesses of the lesson** (list at least three)
1.
2.
3.
4.
5.

C. **What changes in thinking and/or attitudes/behaviors did you observe in your students?** (list at least five)
1.
2.
3.
4.
5.
6.
7.

D. **What changes in thinking and/or attitudes/behaviors did you observe in yourself while developing and presenting the T/LS lesson?** (list at least five)
1.
2.
3.
4.
5.
6.
7.

E. **Give a brief (two- to three-sentence) summary of what occurred in each area.**
1. Information Processing
2. Critical Thinking
3. Decision Making
4. Creative Thinking

F. **How did you provide feedback to the students? Did it seem to be effective?**

G. **Additional comments** (if any).